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EP 0924123 A2

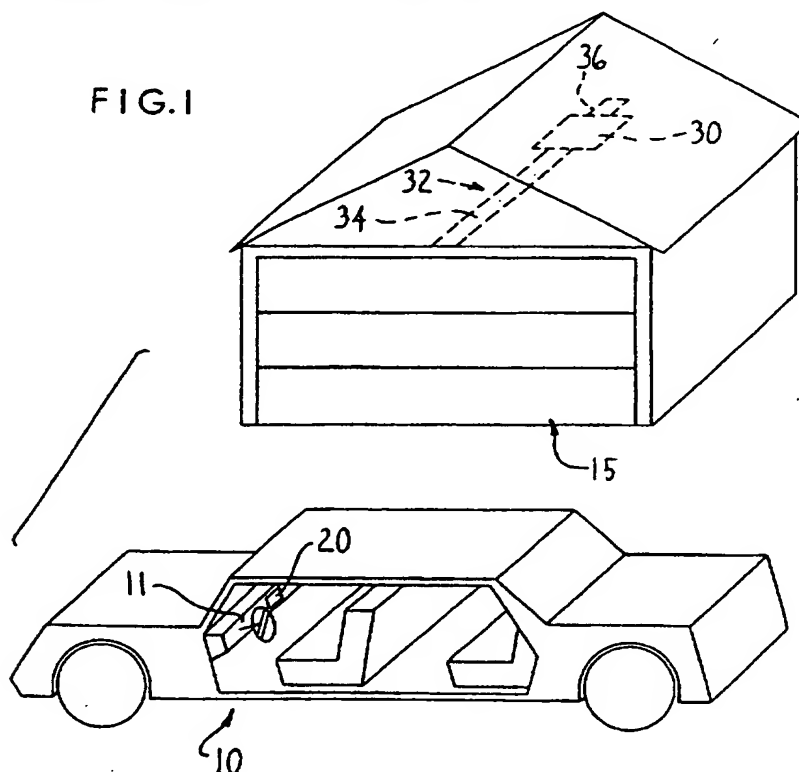
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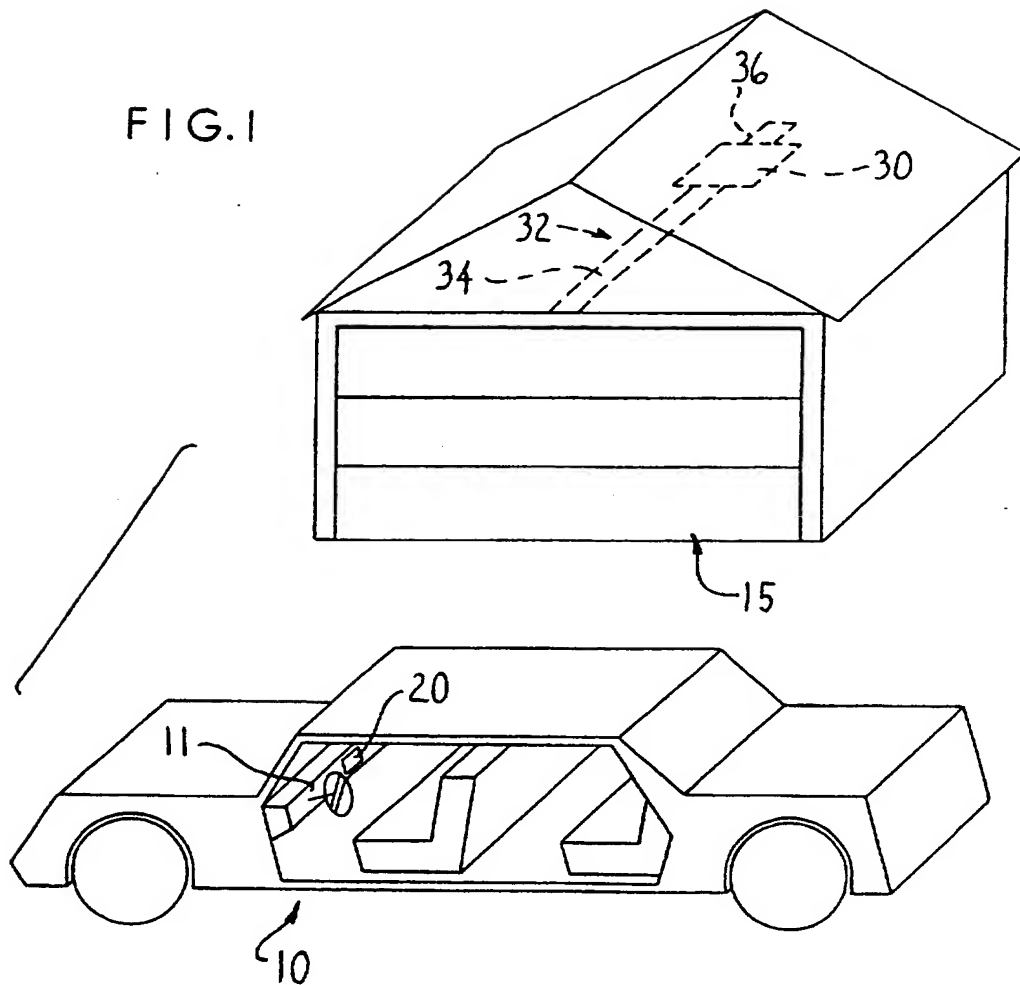
Secured motor vehicle transmitter

(57) A motor vehicle (10) is provided with an anti-theft/tamper transmitter device (20) for actuating a garage door or other opener mechanism (32) where the transmitter device is operated only after a uniquely coded vehicle ignition key is inserted in the ignition switch of the motor vehicle and a control unit on the vehicle determines that the code of the ignition key corresponds to an authorised code. Instead of from a key, the code could come from an ID card, or fingerprint or retinal scanner.



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FIG. 1



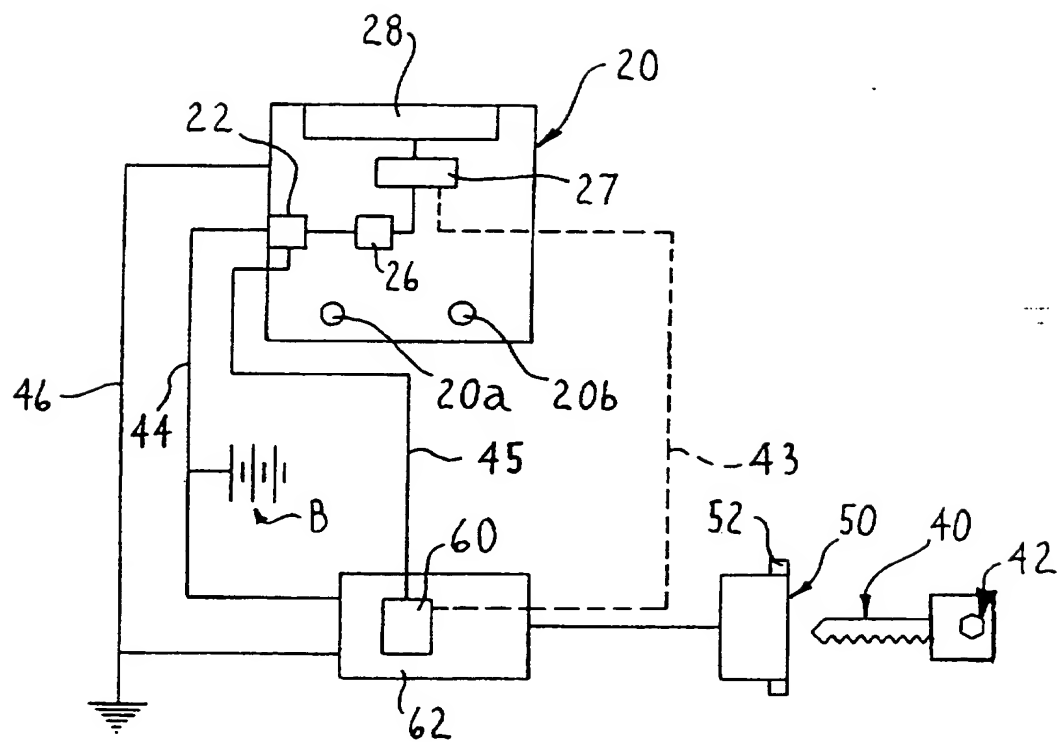


FIG. 2

SECURED MOTOR VEHICLE TRANSMITTER

The present invention relates to motor vehicles having a transmitter device, such as, for example only, a garage door opener, that is anti-theft/tamper protected.

Conventional garage door openers include a battery powered transmitter manually actuated by the driver of a motor vehicle and a receiver which is housed in the garage for operating the garage door opener upon receiving a command radio signal from the transmitter. The transmitter of such conventional garage door opener typically is clipped to a sun visor, stored in a compartment inside the vehicle, or otherwise located inside the vehicle.

Placement of the garage door opener inside the vehicle exposes it to theft by, for example, a thief's breaking a vehicle window or door locking system to obtain access to the vehicle interior. The thief then can use the garage door opener to gain access to the garage and adjoining building.

An object of the present invention is to provide a motor vehicle having an anti-theft/tamper protected transmitter device operable to open a garage door opener or other remote opener mechanism only in response to commands of an authorised user.

The present invention provides a motor vehicle with a transmitter device for actuating an opener mechanism for a garage door, building door, gate, and other access where the transmitter device is operated in an anti-theft/tamper mode only after a control unit authorises operation in response to receiving a valid identification code.

In an illustrative embodiment of the present invention, the transmitter device, such as a garage door opener, is operable only after a uniquely coded vehicle ignition key is inserted in the ignition switch of the motor vehicle and a control unit on the vehicle determines that the code of the ignition key corresponds to an authorised user code. The control unit then controls the transmitter device in a manner that permits execution of a command of the authorised

user. For example only, the control unit can control an electrical power switch of the transmitter device to disable it in the event an authorised code is not detected.

5 The present invention envisions using, in lieu of a coded ignition key, a coded personal identification card, fingerprint scanner in the vehicle, eye retinal scanner in the vehicle or any device that can provide an authorised unique user code to the control unit.

10 The present invention will now be described further, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a schematic view of a motor vehicle having a transmitter device controlled to operate a garage door opener in an anti-theft/tamper mode in accordance with an embodiment of the invention; and

Figure 2 is a block diagram of the transmitter device and vehicle control unit and vehicle ignition components in accordance with an embodiment of the invention.

Referring to Figure 1, a motor vehicle 10 is shown for purposes of illustration as having a transmitter device 20 for operating an electrical motor 30 of a conventional garage door opener mechanism 32 in an anti-theft/tamper mode in accordance with an embodiment of the invention. The garage door opener mechanism 32 includes a door drive 34, such as drive chain, drive screw and the like, connected at one end to the garage door 15 and driven at the other end by electrical motor 30. The electrical motor is actuated by a conventional receiver 36 that receives commands from the transmitter device 20 to open, close or stop movement of the garage door 15. Although the invention can be practised to operate a garage door opener mechanism, it is not so limited and can be used to operate any door, gate, fence and other access opener mechanism to a building, secured area and the like. The motor vehicle 10 typically can include an automobile, truck, van, mini-van, boat and other mobile vehicle from which a remotely located, controlled opener or

other mechanism, such as garage door opener mechanism 32 of Figure 1, can be controlled.

The motor vehicle 10 includes a conventional passive anti-theft ignition system that includes a uniquely coded anti-theft ignition key 40 that is inserted in the ignition switch 50 to operate the motor vehicle. To this end, the ignition switch 50 includes a coil 52 that is energised by a microprocessor control module or unit 60 to generate an RF (radio frequency) field that in turn powers a transponder 42 mounted on or attached to the key 40 to generate a digital identification code. The code is transmitted by RF to microprocessor control module 60 of a vehicle electronic engine control (EEC) unit 62 mounted on the vehicle 10 or to another microprocessor on the vehicle. The passive anti-theft (PAT) system described above can comprise a conventional PAT system provided on presently manufactured vehicles and will prevent starting of the vehicle internal combustion engine unless an ignition key with an unique authorised code is inserted in the ignition switch.

In accordance with an embodiment of the invention, the transmitter device 20 for operating the garage door opener mechanism 32 is operable by a user only after the coded vehicle ignition key 40 is inserted in the ignition switch 50 of the motor vehicle and control module 60 determines that the code of the ignition key 40 corresponds to an authorised vehicle user code. In particular, the microprocessor control module 60 includes one or more identification codes stored in memory and corresponding to one or authorised vehicle users. The control module 60 compares the code received from the ignition key 40 and compares it to the stored code(s) to determine if an authorised vehicle user key is inserted in ignition switch 50.

Referring to Figure 2, the control module 60 is shown connected to the transmitter device 20 by a communication line or wire 45 for transmission of commands to the transmitter device. In an embodiment of the invention

offered for purposes of illustration only, the transmitter device 20 is hard wired by wires 44, 46 to the vehicle battery B and to chassis ground, respectively, and to the control module 60 via communication line or wire 45. The transmitter device 20 typically is mounted on the vehicle dashboard 11, Figure 1, or an overhead console, or elsewhere in the vehicle that is convenient for operation by the vehicle user.

The transmitter device 20 includes a power supply switch 22 in the electrical power supply line or wire 44 between the vehicle battery B and a voltage regulator 26 of the transmitter device 20 or, alternately, in the ground line or wire 46 to the vehicle chassis. The voltage regulator 26 may be used to convert 12 volt DC battery voltage to a usable DC voltage for use by a microprocessor 27 of the transmitter device 20. The switch 22 can comprise a solid state switch or a relay actuated switch. The solid state switch or relay receives commands via communication line 45 from the control unit 60 to close or open the switch 22. The control module 60 thereby can control electrical power to the transmitter 28, which can be a conventional radio frequency or infrared transmitter.

Alternately, the control module or unit 60 can provide operational commands to microprocessor 27 of the transmitter device 20 via optional communications line or wire 43. For example, control module 60 can include software to command the microprocessor 27 to enable the transmitter 28 to execute a command of a user of the transmitter device 20 when the control module 60 determines that the ignition key code corresponds to an authorised code. On the other hand, control module 60 can command the microprocessor 27 to disable the transmitter 28 if the ignition key code does not correspond to an authorised code.

The microprocessor 27 of the transmitter device 20 residing on the motor vehicle typically will receive and store a garage door opening code input thereto from a battery powered garage door opener transmitter (not shown)

provided with the garage door opening mechanism 32. As mentioned above, the microprocessor 27 also can be commanded via communications line 43 by control module 60.

Referring to Figure 2, switch 22 is controlled to be in
5 an open condition to prevent powering of the transmitter device 20 unless the ignition key 40 is inserted in the ignition switch 50 and the control module or unit 60 determines the code of the ignition key 40 corresponds to a stored code of an authorised vehicle user. When the key code
10 so corresponds, the control module or unit 60 commands the switch 22 to close and power the transmitter device 20. The vehicle user then can actuate the transmitter device 20 using the switches or finger pads 20a, 20b to open or close the garage door 15. The ignition key 40 does not have to be
15 turned to the engine "ON" position but merely inserted in the ignition switch 50 as in the conventional PAT system.

The present invention thereby provides a motor vehicle with a transmitter device for actuating an opener mechanism for a garage door, building door, gate, and other access
20 where the transmitter device is operated in an anti-theft/tamper mode only after a control unit authorises operation in response to receiving a user's valid identification code. In the event that a thief obtains access to the vehicle interior, the transmitter device
25 cannot be operated without the coded ignition key such that the thief cannot obtain access to the garage using the garage door opener. Moreover, a child or other unauthorised individual in the vehicle cannot operate or tamper with the transmitter device 20 without an ignition key 40 having the
30 proper unique code.

Although the present invention has been described above with respect to use of coded ignition key to provide a personal identification code, the invention is not so limited. The invention envisions using, in lieu of the code
35 ignition key, a coded personal identification card, a fingerprint scanner in the vehicle, eye retinal scanner or

other personal identification code generator in the vehicle
to determine the presence of an authorised user.

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CLAIMS

1. A motor vehicle having a transmitter device (20) for controlling a mechanism (32) remote from said vehicle (10), means (40) for providing a code, a control unit (60) for receiving said code and determining whether said code corresponds to an authorised code, said control unit (60) controlling said transmitter device (20) to permit execution of a command by a user only if said code corresponds to said authorised code.

2. A vehicle as claimed in claim 1, wherein said transmitter device controls a garage door opener mechanism.

3. A vehicle as claimed in claim 1, wherein said means for providing said code comprises a uniquely coded ignition key.

4. A vehicle as claimed in claim 1, wherein said means for providing said code comprises a coded identification card.

5. A vehicle as claimed in claim 1, wherein said means for providing said code comprises a fingerprint or retinal scanner.

6. A vehicle as claimed in claim 1, wherein said transmitter device includes electrical power switch that is controlled by said control unit.

7. A vehicle as claimed in claim 6, wherein said switch controls electrical power supply wire to said transmitter device from a vehicle battery.

8. A vehicle as claimed in claim 1, wherein said control unit comprises a microprocessor of an electronic engine control.

9. A method of anti-theft/tamper protecting a transmitter device on a motor vehicle that controls an opener mechanism remote from said vehicle, comprising
5 providing a code, determining whether said code corresponds to an authorised code, and controlling said transmitter device to permit execution of a command by a user only if said code corresponds to said authorised code.

10 10. A method as claimed in claim 9, wherein said code is provided by inserting a uniquely code ignition key in a vehicle ignition switch.

11. A motor vehicle with a transmission device for
15 controlling a mechanism remote from the vehicle substantially as hereinbefore described with reference to the accompanying drawings.

12. A method of protecting a transmission device on a
20 motor vehicle substantially as hereinbefore described with reference to the accompanying drawings.

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Claims searched: 1-12

Examiner: Mike Davis
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Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): G4H (HTG), H4L (LCAC)

Int Cl (Ed.7): E05B

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	EP 0924123 A2 (TRW) eg abstract and Fig.5	1-12

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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